

Welcome to the first issue of the e-CERTI newsletter, where you will find teaching and learning topics concerning the Missouri S&T campus highlighted on a quarterly basis. Check out our featured faculty member [Bill Fahrenholtz](#) in this issue, as well as articles about the early findings on [electronic student evaluations](#), and how one instructor found an answer to the problem of [student motivation](#). Enjoy!



**CERTI
NEWSLETTER**
Center for Educational
Research and Teaching
Innovation at Missouri S&T

Bill Fahrenholtz: Fitting the Pieces Together

To the casual observer, [Bill Fahrenholtz](#)' small office in McNutt 322 appears to be filled with disjointed pieces. Leftover trophies and t-shirts from a recent high school student competition claim valuable floor space, along with a bike he rides to work. A stack of exams on his desk awaiting his attention are flanked by a paperweight made out of experimental materials from one of his recent research projects.

These parts are intricately related, though. (Well, perhaps the bike is a stretch.) Teaching, research and service are the components of the Missouri S&T mission, and Fahrenholtz, professor of ceramic engineering, was recognized for sustained excellence in all three by being named as a Faculty Excellence Award winner in 2009.

Although he admits balancing these pieces can be difficult, Fahrenholtz has found a simple approach that evidently works: "When you're focused on student success, the decisions about how to divide your time become more straightforward, easier to make," he says.

He points to the stack of exams which were completed in his class that morning. "These will be graded and returned by the next class period," he says. "I think that's important."

The teaching/research combination

"I could do the same research that I'm doing here at a government lab, but that wouldn't involve graduate students or teaching (undergraduates)," he says. "I really like interacting with students."

Fahrenholtz teaches two undergraduate courses – CER 231: ceramic processing lab and CER 259: materials thermodynamics – as well as one graduate class, MSE 422: thermodynamics and phase equilibria.

"Whether we do undergraduate teaching or research, we're still serving the students," he says. "You can't educate graduate students in materials engineering without a good research program."

His graduate students are involved in studying materials for high temperature aerospace applications and have opportunities to rub shoulders with people from the Department of Defense and NASA. "They get to tell folks we're working on rocket science," he says with a grin.

Fahrenholtz, whose Ph.D. is in chemical engineering from the University of New Mexico, has had over 70 peer-reviewed papers published and holds one ☐

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"I never feel like I am sacrificing research when I focus on teaching. It all depends on how you have your priorities set up."

**--Bill Fahrenholtz
Ceramic Engineering
Professor**

patent in conjunction with [Greg Hilmas](#), another Faculty Excellence Award winner, and research scientist [S.C. Zhang](#). His research accomplishments have not come at the expense of his classroom instruction, though.

“I never feel like I am sacrificing research when I focus on teaching,” he says. “It all depends on how you have your priorities set up.”

Teaching philosophy

Fahrenholtz uses examples from his research as well as from everyday life to keep his course material relevant and current for students.

One example he likes to use is to ask his undergraduate thermodynamics students to think about their caloric intake for one day. If they consume 2,000 calories, he points out that they are burning daily about the same amount of energy as a 100-watt light bulb!



“I try to not repeat what is in the textbook when I am teaching, but design activities that are supplemental and build on the textbook,” he says. “I use examples that students look at every day, and try to make the connection with what they are learning.”

Teaching in higher education has evolved a lot since Fahrenholtz was at University of Illinois at Urbana-Champaign, where he received both his bachelor’s and master’s degrees in ceramic engineering. The emphasis there was on research, and students were held to a very high standard, but there was not necessarily much priority on effective teaching.

In the Materials Science Department at S&T the standards are also very high, but the classroom culture is quite different. “A lot of effort is invested in teaching,” Fahrenholtz says. “The faculty and staff are truly concerned about student success.”

He credits that emphasis to the work of Wayne Huebner, department chair, and his predecessor, Dick Brow. “People are hired in this department because they want to see students succeed,” he says.

Getting WYSE

Fahrenholtz is also involved in attracting younger students to STEM areas. As a high school student in Illinois, he competed in Academic Challenge, which is a high school math and science competition organized by

Worldwide Youth in Science and Engineering (WYSE).

In 1999 when Fahrenholtz came to S&T, enrollment was at a low point and the school was looking for outreach activities that increased the pipeline of STEM students. WYSE was also looking for a way to expand beyond Illinois, so Fahrenholtz brought the two together.

He started the program here 10 years ago with 60 or 70 students, and it has grown to about 40 schools and 500 students statewide. In April of this year, 200 high school students competed in the state finals held on campus, with Fahrenholtz coordinating the event.

It’s a thrill for him to see the former competitors coming back to campus as S&T students, wearing their WYSE t-shirts. Who knows, some might end up counting calories in one of his classes or doing “rocket science” research in the future.

For Fahrenholtz, watching students develop in their chosen fields and go on to exciting careers makes juggling the responsibilities of teaching, research and service a little bit easier.

“That’s what makes it all worthwhile.”

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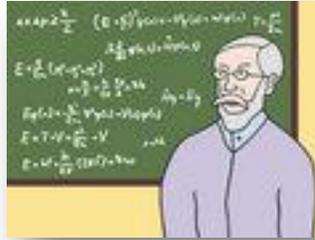
Did You Know ...

You can check out the following books from the CERTI library?
--*"On Course"* 5th edition
--Eric Mazur's *"Peer Instruction"*
--*"McKeachie's Teaching Tips"*
--*"Classroom Assessment Techniques"* and many more!
Email [CERTI](mailto:certi@unc.edu) for more information.

Quote of Note (to consider in terms of higher ed classroom settings):

"The brain that does the work is the brain that does the learning."

--Dr. David A. Sousa, international consultant in educational neuroscience, author of *"How the Brain Learns Mathematics."*



Congratulations to Outstanding Global Learning Instructors

Global Learning 2010 Outstanding Teaching Award of Excellence recipients:

[Dr. Elizabeth Cudney](#)
[Dr. Lokesh Dharani](#)
[Dr. Roger LaBoube](#)
[Dr. Robert Landers](#)
[Dr. David Rogers](#)
[Dr. Paul Worsey](#)

Global Learning 2010 Outstanding Teaching Commendation Award recipients:

[Dr. Abdeldjelil Belarbi](#)
[Dr. Victor Birman](#)
[Dr. William Daughton](#)
[Dr. Cihan Dagli](#)
[Dr. Bih-Ru Lea](#)
[Dr. Ronaldo Luna](#)
[Dr. Ann Miller](#)
[Dr. Robert Montgomery](#)

Early Findings from the Electronic Evaluations Pilot

A pilot program to test the efficacy of electronic student course evaluations was held in Fall 2009, and preliminary results look promising, according to [Stephanie Fitch](#), chair of the Faculty Senate Ad Hoc Committee for Teaching Evaluation, and S&T Business and Information Technology instructor.

A second pilot, encompassing 63 participants and 170 course sections, is under way this semester with results to be available by mid-June. Here are the results Fitch shared regarding the Fall pilot:

- 9 faculty with 12 undergraduate class sections participated
- Class size ranged from 21-190
- A variety of upper and lower level courses and disciplines were included
- Response rates ranged from 52 to 100 percent with an average response rate of 69 percent overall
- Response rates for paper forms in the recent past ranged from 70-74 percent (source: Committee on Effective Teaching)
- Self-reported response ratings from participating instructors were comparable to their usual ratings for the same courses

Student feedback included the comments that the evaluations were "easier to do on my own time," "(I) can be more thoughtful and thorough with comments," "saves paper," "no pressure to complete evaluation in a certain time period," and "good that it does not take up class time."

Instructor feedback comments: "more and better quality student comments," "easier to read, no handwriting issues or privacy concerns," "does not use class time," and "much easier administratively."

To see Fitch's video presentation, originally given to the CERTI Faculty Learning Community April 16, go [here](#).

One Instructor's Solution:

Helping Students Take Ownership of Their Own Learning

For [Irina Ivliyeva](#), a life-altering move from Moscow, Russia, to Rolla, Mo, in 1997, (with a few stops along the way) turned out to be a perfect fit. That doesn't mean, though, that the Russian professor didn't face some challenges common to most instructors when she came to Missouri S&T. Here is one solution she devised to help motivate her beginning Russian students to study harder as they grappled with learning a new language.

"I love teaching engineers!" Dr. Irina Ivliyeva is enthusiastic about the students she teaches in her Russian language and Russian Civilization classes.

"Engineers are prepared to work a little bit harder," she says. "They have an expectation for the material to be difficult and challenging."

Still, after first coming to S&T and seeing the results of her class's mid-term exams, she found that her beginner Russian language students needed additional motivation to study. Although they did well on the first two tests of the semester, which covered the basics, they were not well prepared for the mid-term exam and their scores showed it. The bottom line was that they simply didn't study enough.

What were her options? "It was useless for me to do the 'maintenance talk,'" she says. "They would resent me. If they came up with their own conclusions, though, they might listen."

Toward that end, Ivliyeva developed an anonymous online questionnaire in order to bring about that "aha moment" -- when students discover for themselves how to take control of their grades.

Your grade on the last test was ...

The provocative title of the questionnaire she developed was, "Your Grade on the Last Test Was ..." and involved seven multiple choice and one open-ended question.

Ivliyeva makes the survey optional so no grade is given for participation. However, the fact that the topic involves students' test grades apparently makes it highly pertinent: On her last survey, Ivliyeva had a 74 percent participation rate.

"At first they are very wary," she says. "They wonder if this will negatively affect their grades." It takes her a little time to convince them otherwise. She makes the survey available for two weeks on Blackboard, giving the students ample time to respond.

Question 1 of the survey asks, "How did you study for this exam and when? Mark all that apply." Fourteen different choices are then given, ranging from "read the book" to "made flash cards" to "memorized rules." Consistently she finds that a majority of students have used only a couple of the methods. "Some options have never crossed their minds before," she says, so she achieves her first goal of opening up their minds to new methods of learning a language. 



Another question: *“How much time do you spend every week studying Russian? Select all that apply.”* Answers vary from 30 minutes to two hours for each contact hour in class. The majority of students indicate they do the minimum.

Question 8, the final question of the survey, directs students to take responsibility for their grade improvement: *“What do you think would help you bring your grade up on the next exam?”* It’s an open-ended question, and most students admit that studying longer or using more of the methods available would help them in the future.

Coming up with the answers

Ivliyeva take time to review the survey results with the class. They are able to see how their study habits rank with everyone else’s, and that they are not alone in their struggle to master a new language.

Ivliyeva has been conducting the surveys since she started teaching at S&T, so she has no hard data to determine whether student grades are higher than they would have been had they not taken the survey.

However, from her perspective, she has seen three positive results from the process:

***“The survey forces students to re-think their priorities and make individual practical applications. ... most students decide to buckle down and do it.”
--Irina Ivliyeva***

- Students re-evaluate their study habits;
- Students learn about available help options (such as study groups) instead of struggling alone;
- Students are better able to prioritize their time.

“They are coming up with the answers,” she says. “The survey forces students to re-think their priorities and make individual practical applications. One or two may decide to drop the class; most students decide to buckle down and do it.”

There is another telling indicator of student success in her classes: Those who go through her courses recommend them to their friends. Sixty-four percent of students who answered her pre-course questionnaire last semester say they registered for the class on the basis of a former student’s recommendation.

She has seen her classes grow from ten students per introductory course in 1997 to 22 or 23 per course this past year, which is as high an enrollment as some of the more “traditional” foreign language classes, such as French and Spanish. Very few of her students have to take her course as a degree requirement.

Ivliyeva is pleased that she doesn’t have to play the “nagging parent” role but instead can direct students to find the path toward their own success. She is also happy to share her strategy with others. For a copy of either the pre-course or post-midterm questionnaire, contact her at Ivliyeva@mst.edu.

Dr. Irina Ivliyeva has a Ph.D. in linguistics from the Russian Academy of Science and is proficient in English, French, German and Finnish, besides her native Russian, as well as several classical languages.

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Technology Lite

“The more things change, the more they stay the same,” probably was not penned by a faculty member trying to keep up with the latest technological advances in the classroom! With that in mind, this spot will feature *easy-to-use* and *readily available* resources in technology designed to save you time.

This newsletter’s highlight is www.WatchThatPage.com, a free service that enables you to automatically collect new information from your favorite pages on the Internet by selecting which pages to monitor and what type of information you want to collect. You don’t have to download anything; you simply register and provide the websites you want monitored.



What kind of information can you collect?

- **News and Internet magazines.**
- **Your own/department websites.** This service regularly checks for broken links.
 - **Association websites.** What is the latest news in the professional associations you are connected with?
 - **Foundation sites.** Check for RFPs.
 - **Information on your discipline or research area.** You can set up a feature called “keyword matching” to look for specific information on your chosen websites.

How often and in what format can you receive notifications? (taken from the www.WatchThatPage.com website)

- **Channels.** Get all new content in one email/personal web page, or separate them into several different ones with the *subject* field defined by you.
- **Update rate.** Specify how often you want email updates. Daily? Mondays and Wednesdays? Or none at all (you only want to view the changes on your personal web page).
- **Configurable content.** You can get all the new content delivered to you, or you can be told which pages have changed.
- **Keyword matching.** Enable keyword matching if you are looking for specific information. Keyword matching can be set up to match all changes in a page, or individual paragraphs.

Go [here](#) to take a guided tour of this free service.

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